

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-53 (Canceled).

54. (Currently Amended) An article comprising a panel structure mountable in an automobile vehicle to form a part of a vehicle interior thereof, the panel structure having an exterior surface, ~~at least a portion of which is exposed to the vehicle interior,~~ and an interior surface ~~which is hidden from the vehicle interior when the panel structure is mounted in the automobile vehicle,~~ said panel structure comprising:

a reinforcing substrate;

a layered composite structure comprising an outer layer defining at least a portion of said exterior surface of the panel structure and an inner layer, said layered composite structure being united to a surface of said reinforcing substrate ~~so that said reinforcing substrate serves to reinforce said outer layer;~~

said outer layer comprising ~~an at least substantially dried, light stable, crosslinked polyurethane formulated from a water dispersed first composition comprising at least one coloring agent,~~ at least one light-stable aliphatic thermoplastic polyurethane containing at least one pendent functional group selected from the group consisting of hydroxyl and carboxyl functional groups, and at least one heat-activated crosslinking monomer or agent; ~~said light stable aliphatic thermoplastic polyurethane being molded with and at least partially crosslinked by the heat activated crosslinking agent; and~~

said inner layer ~~being thicker than said outer layer and~~ being formed directly on said outer layer such that said inner layer has ~~[[a]]~~ an outer surface adjacent to ~~and interfacial chemical bonds with~~ an inner surface of said outer layer, said inner layer ~~and said interfacial chemical bonds being formed by applying a composition comprising a thermoplastic polyurethane resin material having at least one ethylenically unsaturated bond in its backbone,~~

at least one pendent hydroxyl group, or a combination thereof ~~onto said inner surface of said outer layer,~~

wherein an interfacial chemical bond is formed between at least one of an unreacted functional group of said at least one light-stable aliphatic thermoplastic polyurethane and an unreacted functional group of said at least one heat activated crosslinking monomer or agent of said outer layer and at least one of said at least one ethylenically unsaturated bond and at least one pendent hydroxyl group of said inner layer.

55. (Previously Presented) An article according to claim 54, wherein the heat-activated crosslinking agent is carbodiimide.

56. (Previously Presented) An article according to claim 55, further comprising a relatively rigid polyurethane cellular foam interposed between said layered composite structure and said reinforcing substrate that adheres said layered composite structure to said reinforcing substrate, wherein said outer layer is provided with a compressing feel by said relatively rigid polyurethane cellular foam and said inner layer.

57. (Previously Presented) An article according to claim 56, wherein said outer layer has a thickness in a range of from about 1.0 mils to about 1.5 mils.

58. (Previously Presented) An article according to claim 56, wherein said inner layer has a thickness in a range of from about 40 mils to about 60 mils.

59. (Previously Presented) An article according to claim 56, wherein said at least one light-stable aliphatic thermoplastic polyurethane and said heat-activated crosslinking agent can be premixed and stably stored for at least up to 24 hours at room temperature.

60. (Previously Presented) An article according to claim 56, wherein said panel structure is a door panel.

61. (Previously Presented) An article according to claim 56, wherein said panel structure is an instrument panel.

62. (Currently Amended) An article according to claim 54, wherein said outer layer comprises a the water-dispersed composition has having a water concentration of from about 10% by weight to about 80% by weight.

63. (Currently Amended) An article according to claim 54, wherein said outer layer comprises a the water-dispersed composition has having a solvent concentration of from about 9% by weight to about 15% by weight.

64. (Previously Presented) An article according to claim 63, wherein the solvent is N-methyl pyrrolidone.

65. (Previously Presented) An article according to claim 64, wherein the water-dispersed composition further comprises at least one member selected from the group consisting of glycol ether acetate and xylene.

66. (Currently Amended) A process for making a panel structure mountable in an automobile vehicle to form a part of a vehicle interior thereof, the panel structure comprising a reinforcing substrate and a layered composite structure, ~~the reinforcing substrate being hidden from the vehicle interior when the panel structure is mounted in the automobile vehicle,~~ the layered composite structure comprising an outer layer ~~defining at least a portion of an at least partially exposed exterior surface of the panel structure~~ and an inner layer, said process comprising the steps of:

applying a ~~water-dispersed~~ first composition onto a first mold surface ~~having a complementary shape to an outer surface of the outer layer, the water-dispersed,~~ said first composition comprising at least one light-stable aliphatic thermoplastic polyurethane ~~containing~~ containing at least one pendent functional group selected from the group consisting of hydroxyl and carboxyl functional groups, ~~at least one coloring agent,~~ and at least

one heat-activated crosslinking monomer or agent to form said outer layer of said layered composite structure; and

~~applying sufficient heat for inducing partial crosslinking of the light-stable aliphatic thermoplastic polyurethane with the heat-activated crosslinking agent;~~

~~substantially drying the water-dispersed composition while on the first mold surface for forming the outer layer;~~

casting a second composition comprising a thermoplastic polyurethane resin material having at least one ethylenically unsaturated bond in its backbone, at least one pendent hydroxyl group, or a combination thereof onto an inner surface of the outer layer while on the first mold surface ~~for forming~~ to form said the inner layer of said layered composite structure,

whereby an interfacial chemical bond is formed between at least one of an unreacted functional group of said at least one light-stable aliphatic thermoplastic polyurethane and an unreacted functional group of said at least one heat activated crosslinking monomer or agent of said outer layer and at least one of said at least one ethylenically unsaturated bond and at least one pendent hydroxyl group of said inner layer.

~~which comprises the thermoplastic polyurethane resin material at least partially crosslinked with the light-stable aliphatic polyurethane of the outer layer via unreacted functional groups of the heat-activated crosslinking agent and for interfacially chemically bonding the inner surface of the outer layer to an adjacent surface of the inner layer; and~~

~~uniting the layered composite structure with the reinforcing substrate so that the reinforcing substrate reinforces the outer layer while retaining a touch, color, and configuration of the exposed portion.~~

67. (Previously Presented) A process according to claim 66, wherein the heat-activated crosslinking agent is carbodiimide.

68. (Currently Amended) A process according to claim ~~67~~ 66, further comprising the steps of:

transferring the layered composite structure from the first mold surface to a second mold surface; and

providing the reinforcing substrate on a third mold surface having a complementary surface to an interior surface of the panel structure;

~~—wherein said uniting step comprises applying a reactive mixture to the layered composite structure while on the second mold surface or to the reinforcing substrate provided on the third mold surface, arranging the second and third mold surfaces so that the layered composite structure and the reinforcing substrate collectively define a mold cavity for accommodating the reactive mixture, and foaming the reactive mixture for forming a relatively rigid polyurethane cellular foam that adheres the reinforcing substrate to the layered composite structure, and~~

~~—wherein the outer layer is provided with a compressing feel by the relatively rigid polyurethane foam and the inner layer.~~

69. (Currently Amended) A process according to claim 67 66, further comprising the steps of:

transferring the layered composite structure from the first mold surface to a transparent surface of a holding platform;

detecting and reinforcing rupturable portions of the layered composite structure for preventing failure of the same during said uniting step;

transferring the layered composite structure from the transparent surface to a second mold surface; and

providing the reinforcing substrate on a third mold surface having a complementary shape to an interior surface of the panel structure;

~~wherein said uniting step comprises applying a reactive mixture to the layered composite structure while on the second mold surface or to the reinforcing substrate provided on the third mold surface, arranging the second and third mold surfaces so that the layered composite structure and the reinforcing substrate collectively define a mold cavity for accommodating the reactive mixture, foaming the reactive mixture for forming a relatively~~

~~rigid polyurethane cellular foam that adheres the reinforcing substrate to the layered composite structure, and~~

~~wherein the outer layer is provided with a compressing feel by the relatively rigid polyurethane foam and the inner layer.~~

70. (Currently Amended) A process according to claim ~~67~~ 66, wherein said ~~drying step is performed by evaporating the water from the~~ first composition comprises a water-dispersed composition that is substantially dried prior to said casting step.

71. (Currently Amended) A process according to claim ~~67~~ 66, wherein the outer layer has a thickness in a range of from about 1.0 mils to about 1.5 mils.

72. (Currently Amended) A process according to claim ~~67~~ 66, wherein the inner layer has a thickness in the range of from about 40 mils to about 60 mils.

73. (Currently Amended) A process according to claim ~~67~~ 66, further comprising the step of precoating the first mold surface with a microcrystalline wax mold releasing agent.

74. (Currently Amended) A process according to claim ~~67~~ 66, wherein the light-stable aliphatic thermoplastic polyurethane and the heat-activated crosslinking agent can be premixed and stably stored prior to said applying step for at least up to 24 hours at room temperature.

75. (Currently Amended) A process according to claim ~~67~~ 66, wherein the first mold surface is heated during said applying step.

76. (Currently Amended) A process according to claim ~~67~~ 66, wherein the first mold surface has a complementary shape to an exterior surface of a door panel.

77. (Currently Amended) A process according to claim ~~67~~ 66, wherein the first mold surface has a complementary shape to an exterior surface of an instrument panel.

78. (Currently Amended) A process for making a panel structure mountable in an automobile vehicle to form a part of a vehicle interior thereof, the panel structure comprising a reinforcing substrate and a layered composite structure, ~~the reinforcing substrate being hidden from the vehicle interior when the panel structure is mounted in the automobile vehicle,~~ the layered composite structure comprising an outer layer ~~defining at least a portion of an at least partially exposed exterior surface of the panel structure~~ and an inner layer, said process comprising the steps of:

providing a microcrystalline wax mold releasing agent on a first mold surface, the first mold surface being heated to a first ~~elevated~~ temperature for melting and dispersing the microcrystalline wax mold releasing agent;

applying a ~~water-dispersed~~ first composition onto the first mold surface ~~having a complementary shape to an outer surface of the outer layer and~~ containing the microcrystalline wax mold releasing agent dispersed thereon, the ~~water-dispersed~~ first composition comprising at least one light-stable aliphatic thermoplastic polyurethane containing at least one pendent functional group selected from the group consisting of hydroxyl and carboxyl functional groups, ~~at least one coloring agent,~~ and at least one heat-activated crosslinking agent, the first mold surface being heated to a second ~~elevated~~ temperature for inducing at least a partial crosslinking of the light-stable aliphatic thermoplastic polyurethane with the heat-activated crosslinking agent;

substantially drying the water-dispersed first composition while on the first mold surface by heating the first mold surface to a third ~~elevated~~ temperature for forming the outer layer with an exterior surface;

casting a second composition comprising a thermoplastic polyurethane resin material having at least one ethylenically unsaturated bond in its backbone, at least one pendent hydroxyl group, or a combination thereof onto an inner surface of the outer layer while on the first mold surface to form the inner layer ~~which comprises the polyurethane at least partially crosslinked with the light-stable aliphatic thermoplastic polyurethane of the~~

~~outer layer via unreacted functional groups of the heat-activated crosslinking agent for forming the layered composite structure comprising interfacial chemical bonding between the inner surface of the outer layer to an adjacent surface of the inner layer, whereby an interfacial chemical bond is formed between at least one of an unreacted functional group of said at least one light-stable aliphatic thermoplastic polyurethane and an unreacted functional group of said at least one heat activated crosslinking monomer or agent of said outer layer and at least one of said at least one ethylenically unsaturated bond and at least one pendent hydroxyl group of said inner layer; and~~

uniting the layered composite structure with the reinforcing substrate so that the reinforcing substrate reinforces the outer layer while retaining a touch, color, and configuration of the exposed portion.

79. (Previously Presented) A process according to claim 78, wherein the heat-activated crosslinking agent is carbodiimide.

80. (Currently Amended) A process according to claim 79, wherein the first ~~elevated~~ temperature, second ~~elevated~~ temperature, and third ~~elevated~~ temperature are ~~all the same and~~ in a range of from about 140°F to about 160°F.

81. (New) An article according to claim 56, wherein said unreacted functional groups of said outer layer comprises said at least one heat-activated crosslinking monomer or agent.

82. (New) A process according to claim 66, wherein said unreacted functional groups of said outer layer comprises said at least one heat-activated crosslinking monomer or agent.

83. (New) A process according to claim 78, wherein said unreacted functional groups of said outer layer comprises said at least one heat-activated crosslinking monomer or agent.